Chapter XI
HOW APPERCEPTION MASSES ARE FORMED

OUR next question is, how are such groups or masses of ideas formed in the mind? On what grounds do they set up their relationship?

338. Ideas may be divided into three classes: Similar, Disparate, and Contrary.

Similar Ideas

339. When a fresh presentation occurs, if there is a similar (or identical) idea already in the mind it comes to meet it. They have an attraction for each other, like bubbles in a teacup. When the two meet in consciousness they fuse and become a stronger idea.

340. For example, suppose we want to teach a little child the major tonic chord and the names of its constituents. If the child is very young—say five or six—but has a good ear, we simply let him listen and imitate, learning **d m s** as a diminutive tune, without any talk about the character, or mental effect, of its sounds. Each time he listens he imitates better. Now in this case each new presentation is *identical* with previous presentations. The child adds nothing to his knowledge, but at each fresh presentation his idea of **d m s** is clearer and stronger, until at last he can sing it when called for without pattern.

341. When he can do this, we pattern to him another wee tune: **s m d**. Now he notices that the little tune goes down—the first one went up.

Then we give **d s m**, **s d m**, and so on. In all this there is no new knowledge, but a working over of ideas which, compared with each other, are found to be *similar*. They fuse and form a little apperception mass, or group of ideas, ready to welcome the other related scale-sounds. At this stage we would not use symbols; only things and their names, as the child learns other things with their names before he learns to read.

342. The whole series of *time*-lessons in the 'Guide' is an example of the same kind of process. The central idea is that of the *Pulse* in music, discovered by listening, strengthened by comparison with the pulse in our bodies. Listening again, the child notices that the pulses in music are not all alike, some are stronger than others, and so he gets the idea of *Accent*. Again, he finds that these stronger pulses come at regular intervals. Sometimes he feels them alternately with weak ones, sometimes one in three, or one in four. They seem to *measure* out the music, like inches on a foot-rule or stakes in a fence. To this little apperceptive group of ideas—Pulse, Accent, and Measure—we refer all that we subsequently have to teach under the head of Time: rhythm, syncopation, rubato, the characteristics of dance-forms, and so on. They are similar ideas.

343. Each new pulse-division in simple time is similar to the last—I am still speaking without reference to notation—by virtue of the feeling of *two*-ness that runs through them all. The divisions in compound time are like each other through the feeling of *three*-ness; while simple and compound

time, though they differ from each other, are linked together by the persistence of the pulse-feeling itself. We shall have more to say about these threes and twos presently.

344. Remember, then, that ideas which are similar to each other have a natural affinity. When they meet in consciousness they fuse easily and become stronger.

Disparate Ideas

345. But we have often to link together in the pupil's mind ideas which have no natural affinity whatever. They cannot be compared with each other, because they belong to totally different classes. They will not fuse; but if they appear frequently in the mind together they become closely associated; and this artificial association may become so strong that when one of the associated ideas appears in consciousness it is followed by the other. We can hardly think of Wellington without thinking of Waterloo; yet, the one being a man and the other a place, they belong to different classes.

346. Ideas of this kind are known as *Disparate* ideas; the process of connecting them is called *Complication*, and the total idea resulting from their association is termed a *Complex* idea.

347. The term 'complication' may be a little misleading, because our everyday use of it generally includes the notion of some difficulty. A 'complication' is something to be deplored, a complicated problem is a tangled skein that has to be unravelled; but in the technical use of it here the notion of difficulty is not necessarily present

It only means *the arbitrary connection of two or more ideas that have no natural connection with or relation to each other*. The complex may be quite simple (though that sounds contradictory); it may also be complicated in our everyday sense if the complex idea includes a great many elementary ideas.

348. The notion of difficulty, arising from our accustomed use of the word, may lead you to suppose that complex ideas belong to the adult mind, but this is not so.

> 'Little Miss Muffet sat on a tuffet,
> Eating her curds and whey;
> There came a big spider and sat down beside her
> And frightened Miss Muffet away.'

Begin this rhyme for any child and the child will probably finish it; yet spiders and curds and whey have no natural connection with each other or with little girls in general; they are all disparate ideas. But they are brought together in the story, and at each repetition they appear together in consciousness. The story first takes hold, and repetition welds these disparate ideas into a lasting complex.

349. Every day the child's complexes grow; fresh connections are made in many different directions, and the mind becomes broader—more intelligent, we say—more easily approached, because approachable from many sides.

350. In all departments of teaching we have to make arbitrary connections, and if we know how nature does it we see our way to bringing it about. I have said elsewhere that the mind performs all

these processes of itself (225). Our part, as teachers, is to provide the conditions under which the desired process shall occur; to secure that right connections shall be made and wrong ones avoided.

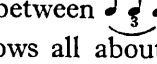
351. Symbols, such as notes of different shape, have no natural connection with the sounds we have ordained that they shall represent. Ideas of things seen and ideas of things heard belong to different classes. So the moment we approach the teaching of notation we have to deal with disparate ideas, and at every step there is the formation of a new complex. The connection is arbitrary; how shall we effect it? Just by introducing sound and sign together, as strikingly as we can, and then letting them appear again and again together in consciousness. There is nothing in a thing of this shape to suggest sounds to any but the initiated. Nevertheless, by being constantly brought together, and *used* together, such a close connection is formed that you, my readers, cannot look at that little pulse-group without hearing (mentally) the patter of its rhythm.*

352. When one part of a complex appears in

* The formation of such a complex in the mind of the ordinary pupil takes a considerable time, for it is the result of his total and slowly accumulative experience in the meeting of the two ideas. But we can hasten the process considerably by the use of the time-names. The divisions of a pulse-group— for example—and the syllables of the corresponding time-name, *tafa-té*, have the same *ear*-effect. They are similar ideas, and they fuse. We have still to make the connection with the symbol, an arbitrary connection, but here the time-name helps again. It seems to fit the eye-group as well as the ear-group, and so it forms a useful *link* between them, helping the formation of the complex; but the secret is in the continual use of sound and sign in combination when once their connection is clearly understood.

the mind we may expect the other to follow. I have instanced Wellington and Waterloo. The idea of sonata calls up that of Beethoven, and *vice versa*; *Gerontius* and Elgar would probably suggest each other. So we should expect the sight of a symbol to bring to mind the thing it symbolizes, and *vice versa*; and this usually happens. When people are learning to read their own language they hear the words mentally as they read. And by the time they can read with ease they can also usually *express* in the notation of the language words that they hear, actually or mentally; i.e. they can write as well as read.

353. But with regard to musical notation and the sounds it expresses our experience is different. There are very familiar cases of people who have 'learnt music' for many years, but in whose mind sound and symbol are very loosely connected: amateurs — and others — who cannot take up a song in a music shop and hear its melody, who cannot judge whether a pianoforte piece is suitable for a pupil until they have 'tried it over' on the piano. It is well known, too, that girls may work harmony exercises for years and have no mental realization of the chords they build up. The reason for all this is obvious. There has been no systematic association of sound and sign.

354. Then you all know the 'new pupil' who is hazy as to the difference in effect between  and , though in theory she knows all about it; who habitually misinterprets and other compound pulse-divisions; who ignores dots and

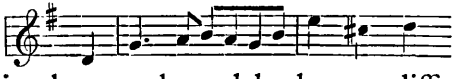
rests, though she can tell you their arithmetical values. Such cases can be accounted for. The complex has been imperfectly formed. When the manipulation of an instrument is concerned, the complex is threefold: symbol, sound, and movement. The sight of a musical phrase on paper will suggest not only the sounds it represents but the movements on the keyboard (or finger-board) necessary for its interpretation (113). The complex includes visual, aural, and motor images, and people who realize mentally the music they are looking at will often be seen to make the suggested movements. Now if, during the pupil's early training, theory and practice are divorced, as they so frequently are, the response of muscle to brain may be defective; the knowing and the doing have not been associated in the learning process, and the expected behaviour does not follow the perception of the symbol (116).

355. But it is curious that in the case of *skilled* readers the suggestion does not always work both ways, as we should expect it to do. There are people who are absolutely reliable readers of time-notation, good sight-players, incapable of making such mistakes as those I have mentioned, who yet cannot write a simple time-phrase dictated to them. You may ask: if the complex is so far formed that the sight of the notes unfailingly brings into the reader's consciousness the corresponding rhythm, why does it not work in the opposite direction—why does not the hearing of the rhythm bring into the mind of the same individual the corresponding notation?

356. Sometimes the difficulty is one of hearing, i.e. of attaching a *definite meaning* to what is heard. Here again the time-names are the needed link. But it is possible that the correct notation may have come into the mind, and that the hitch may only be due to the fact that in the individual's early experience the mere mechanical element of writing was not systematically associated with hearing. Let us think of an analogous case.

357. If you dictate to an ordinary person such a sentence as, 'The way was long, the wind was cold,' he will write it without any hesitation. He does not have to think about the spelling of each word or how to make each letter. He takes in the sense of the phrase and his pen seems to work by itself. Watch the composer at work: precisely the same thing happens. He has a musical thought, and he puts it on paper with the same facility as if he were writing a letter to a friend. His pen goes of itself. In both these cases the mere mechanical part, and even the spelling, has become automatic by habit, and the upper brain is left free to deal with the thought itself; to *hold it fast in its completeness* till it is committed to paper.

358. The unaccustomed writer may hear or may have in his mind such a phrase as—



It is simple enough, and he has no difficulty in singing or whistling it. But if he wants to put it on paper he has to think about what notes to use and where to place them, whether stems should go

up or down, and so on; about the *spelling*, in fact, and the mere writing. And while the upper brain is occupied with these mechanical details he loses hold of the thought itself and it disappears.

359. Two kinds of experiences go to convince us that this is so. First, examination candidates who have had insufficient practice in writing invariably want to *hum* the tune while they write; or if it is a test in time alone, they will keep *tapping* bits of it. That is the effort to keep hold of the phrase, which is slipping away while the mind is attending to the mechanical work. And they will ask: 'May I hear it again, please?' and then we know that it is gone. When these symptoms show themselves we expect to find certain kinds of mistakes in the written exercise, and we are seldom disappointed. And yet these candidates have all the necessary knowledge about notation. It is a case of divided attention. Between two stools, etc.

360. And the second proof is that when children have been systematically trained in the mental perception of time and tune—separately at first but gradually associated—and when the processes of *hearing*, *writing*, *reading*, and *playing* have been combined in every lesson, they can write easily and rapidly what is dictated to them.

361. It is true that many of us have always been able to express in notation whatever we could definitely hear or definitely think; and that, too, without the systematic training to which I have alluded. But this fact neither proves nor explains anything. In our case it happened that this complex was formed, as many others are formed,

without any deliberate teaching; that is all that we know. But to dismiss the problem with the remark, '*I* never had any difficulty,' as so many problems are dismissed, does not help. In teaching we must do something more than trust to luck, and we ought to be helped by knowing that a lasting and reliable complex can be formed by *systematic association of its elements.*

362. Sometimes we have, as it were, to drag an idea away from one complex and force it into a fresh connection. The names A B C D E, etc., which we give to the pianoforte keys, have another connection in a child's mind before he comes into the hands of his music teacher, and this may cause confusion, though only one child in a thousand would tell us that he felt puzzled. The possibility of such a difficulty would never have occurred to me if I had not been brought face to face with it in the sturdy refusal of a very young child to call the white key between the two black ones by its name, D. He had evidently just learnt his alphabet, and, confident in his new knowledge, he stoutly maintained that *dee* was the name of a thing this shape (D), so it couldn't be the name of that other thing. But when it was explained to him that the piano keys, poor little things, had no names of their own, so had to *borrow* the names of some letters of the alphabet, he withdrew his opposition, to the manifest relief of his young and inexperienced teacher. To me the interesting thing was that so young a child—he was about five, far too young for pianoforte lessons—could see the possibility of separating a thing from its

name and transferring the name to a different thing. What had happened once might happen again; and that was why, in the next edition of the 'Guide,' I took the bull by the horns and anticipated the difficulty (Preliminary Course, Second Lesson).

363. Whenever we have to break up a complex and form a new group we must bring the new group into consciousness repeatedly, until the complex is safely formed. This does not mean that the old connection is destroyed. When, in the mind of the little boy, *dee* entered into a piano-key complex, its old alphabet complex was not shattered. But sometimes we find a wrong complex in a pupil's mind, and then we have to shatter it, or at least to separate its elements and keep them apart and bring them into new and right connections.

364. Disparate ideas, just because they have no natural connection with each other, can be formed into all kinds of complexes at will.

365. Pitch and time are disparate ideas, and every musical thought is a complex. Because the disparate elements are so intermingled in music itself they are necessarily intermingled in its notation, and this to such an extent that we forget its composite character and speak of it as if it were one thing, whereas it is two. We have also, most of us, a careless habit of saying, 'What is the name of that *note?*' when what we mean, and ought to say, is 'What is the name of that line or space?' Slipshod speech is likely to lead to wrong or unclear notions in a pupil's mind, but if the teacher

thinks clearly about the complex nature of our notation she will guard against this as far as possible. All musical notations are doubly complex. Pitch-sounds and pitch-symbols, time-values and time-symbols, are associated; and then these two complete systems, each representing a different class of ideas, are united in the *very complicated complex* of musical notation. They should be kept distinct by distinctive naming. What are the facts? The function of a note is to indicate a sound of a certain pitch, which has an alphabetical name, and to tell us for what proportion of time it has to be sustained. The name of the *sound* indicated may be F or D or C (names which we extend to their associated symbols, line or space); the name of the *note* is minim or quaver as the case may be, or two-pulse note, half-pulse note, if we so prefer. So, if when referring to pitch we teach a child to say that the name of a *note* is F or C we are wrong; though 'What is the pitch of that note?' would be correct. If we are referring to time, 'What is the *value* of that note?' is a better question. No doubt we shall always speak of the 'notes' of a bird, or of a singer's high or low 'notes,' because it is not easy to express ourselves otherwise; but in teaching, and especially in the early teaching, when the important first impressions are given, let us at least be as accurate as we can.

366. When people talk of teaching a little child music, they usually mean teaching him to decipher this very complex invention, which, though it is an admirable means of registering musical thought, is no more music than our alphabet is poetry.

When a child is singing by ear, dancing to merry tunes, listening to the songs his mother sings to him, to the pieces she plays when she thinks he is not listening, he is learning *music*; and he should know a great deal of music in this way before he is asked to tackle its notation. Children learn to know all things as wholes before they notice parts, and every whole tune a child knows is material that we may later on reduce to its elements, pull to pieces and put together again when dealing with that complex matter of notation (194). The alphabet must be learnt if the child is by and by to read literature for himself and by himself; and notation must be learnt if he is to read music for himself and by himself, and not to be dependent on the music other folk make for him. But I venture to assert that a child who has spent his first seven (or even eight) years in singing and listening will know more about 'the elements,' i.e. the meaning and use of notation, when he is ten, than the child who begins at five and has not had time for this most precious preparation.

367. And when we do begin, what have we to do? To disentangle the complex, to separate the elements, to teach a little bit of pitch, a little bit of time, to link each little bit of each to its symbol, and then to link the two little complexes together, and to present them together again and again in various combinations for recognition and for use. So the great complex of visible music is built up, easily because apperceptively; the ideas assimilated in one lesson waiting, as it were, to welcome those that may come in the next.

368. I should like to make a suggestion here. Children very often practise their pieces without noticing either the name of the piece or the name of the composer, and cannot tell you either if you ask them. Thereby they miss much that is of value; for the title of the piece is very often suggestive of its mood, and therefore a clue to its interpretation; and if the performer is to be an interpreter he cannot leave the composer out of his calculations. The musician (the teacher) knows this, and the music, its composer, and the title its composer gave it usually form a lasting complex in her own mind. She sometimes forgets that such a complex ought to exist in the mind of her little pupil.

369. A very good teacher of my acquaintance used to make her young pupils announce the title of the piece and the name of the composer before beginning to play. And why not? If the little reciter, before beginning his poem, announces: 'My bed is a boat, by Robert Louis Stevenson,' why should not the young pianist, on seating himself at the piano, turn to his audience and say: 'An Old-world Measure, by Thomas Dunhill;' or, 'Seven League Boots, by John Kinross'—giving them a notion of what they are going to hear?

370. A child can understand, from his own experience, that people *like* to know what they are going to hear, because they can listen with more interest; that that is why they buy the programme of a concert, and that when there is no programme he should tell them what he is going to play. The habit of doing this would go far to help a memory

which some of us lack: the memory of *opus* numbers. For, as the habit grew, the first thought that would come into the player's mind would be: 'What am I going to play?' and if there were no title the answer would have to be given in *opus* number and key; for example, 'Sonata in A, by Beethoven, Op. 2, No. 2.'

371. The memory-test suggested in the 'Guide' (end of First Step) also helps in this direction, viz. to play a bit of the melody of one of the duets and ask what it is. Later, a passage from any piece in the pupil's repertoire: pupil to name the piece, the composer, and if possible the key.

372. In a Canadian school I heard tests of this kind in knowledge of literature given to the children. A passage was quoted and the class was asked, 'Who wrote that?' The passages quoted were not always from the classics, but often from those charming minor poets whom we find on that side of the Atlantic; poems that had some correspondence with the children's own experiences and stage of development. Their familiarity with these was remarkable.

373. A competition of this kind would make an amusing item for a 'Musical evening' at school, but it would most probably be a failure if the associations had not been formed in lesson-time.

374. Such devices would help towards an organized system of musical knowledge, and perhaps in a generation or two people would cease to say: 'Oh, please play that awfully jolly thing you played the other day . . . you know . . . it was a fright-

fully sad tune . . . I think you said it was by Beethoven—or was it Cyril Scott?'

Contrary Ideas

375. Ideas of the third class (contrary ideas) seem to give students the most trouble, perhaps because the term *contrary* suggests that ideas of this kind must be even more unlike each other than disparate ideas. But it is not so; for while disparate ideas belong to different classes, contrary ideas belong to the same class—the same family, as it were—but within that class they differ. This is usually illustrated by reference to colour. All colours belong to the same family, but yellow differs from green, red from blue, and so on. What happens when ideas of this kind meet in consciousness? They do not fuse, like similar ideas, they will not combine, like disparate ideas. They actually get in each other's way, obscure each other, so that we cannot realize both at once.

376. Now it is important to be quite clear as to what is meant by *realizing* an idea. It is to concentrate one's whole attention on the idea, to let it *occupy the focus* for the time being. 'To realize the idea of red we must concentrate upon it all the forces that are appropriate to the idea of colour; and in so doing we are drawing off all the force that might otherwise be concentrated on some other colour.'—(*Adams.*) If we try to think of red and blue at the same time we find that we are not fully realizing either, that our attention is actually oscillating between them, and that if we

succeed in realizing the one the other disappears altogether. Try it.

377. I find that some people have a difficulty in thinking of colour apart from coloured objects. This may help. As children we have all amused ourselves by looking through pieces of coloured glass. When doing that we did not really imagine the objects we looked at—trees and houses—as being red or blue; but we got a general idea of blueness or redness pervading everything. Can you not, in imagination, get that vivid idea of colour as colour? Think red . . . think blue . . . think both together. . . . You cannot. As one colour-idea approaches the focus the other recedes, and when it is fully realized the other is gone.

378. Another example. Think the rhythm of any familiar *waltz tune*. Give it your full attention. Realize it. . . . Think the rhythm of a *gavotte* in the same concentrated way. . . . Now try to realize both rhythms together. . . . You cannot. You find yourself thinking of each in turn, and the effort to realize or give full attention to one of them blots out the other. The two ideas belong to the same class, but within that class they differ.

379. This curious effect of contrary ideas is called *arrest*. They arrest each other. Both are making for the top of the dome, and they get in each other's way. Sometimes one gets there and the other retires, but very often they both descend to a sub-focal or sub-marginal position, or they clear out of the dome altogether when they find

they are not wanted. The meaning of this we shall see more clearly by and by.

380. The theory of arrest accounts for the difficulty many people find of playing three notes against two, four against three, eight against six, etc. Devices for dealing with these mixed rhythms are given in most books about pianoforte playing. We are all familiar with these. They are based on a comparison of the arithmetical values of the notes in the two groups. The theory and the diagrams are quite easy to *understand*, but in practice it all breaks down, because such devices always suppose an enumeration which it is impossible to make with sufficient rapidity. It also supposes *attention to both rhythms at once*, and that is what we cannot give.* If we really *attend* to the pulse divisions in one part we lose consciousness of those in the other; and that is, after all, the best way to succeed. Call in the muscle memory. Practise each hand separately till its rhythmic movement becomes automatic. Then attend to the *meeting places of the beats*, and let the rest take care of itself. You will find yourself listening now to one hand now to the other, shifting the attention from one rhythm to the other, detecting an irregularity now here now there, when, if you are wise, you return to separate-hand practice.

381. For mixed rhythms the next best thing to a slow tempo is a very quick one. Chopin's C♯ minor Impromptu is very much easier to play than

* Three against two can be played by a child, by a simple combination of time-names, making a new whole; but for anything more complicated than that even the time-names fail.

some more innocent-looking pieces of the mixed rhythm kind. The rate of movement is quick and we get a two-pulse swing in either hand, the one in simple and the other in compound time. By fixing our attention on the beat-notes when we play both together the two-pulse swing carries us along, but if we try to realize the pulse-*divisions* of both rhythms we are lost. Let the meeting place on the beat be the focal idea, and let the contrary rhythms fight it out as sub-focal or sub-marginal ideas. Side by side in the margin of consciousness they live on good terms, but they *cannot be in full focus at the same time.*

382. It may comfort us to know that if the player cannot realize the two rhythms together, neither can the listener. If you try to listen critically to a passage of this kind—for example, No. 20, Book IV, of Mendelssohn's Lieder—you will find that you can only be certain about the evenness of the pulse-divisions in each part by shifting your attention from one part to the other. But what the least educated listener *can* hear is failure to make the beat-notes coincide. He may not know what is wrong, but he will feel that there is confusion somewhere. If the beat-notes meet, the equalization of the sub-divisions will not trouble him very much. It is only the ear of the expert that knows what is the matter.

383. To people with a naturally strong time-sense 5-4 time is at first a little irritating. But here the threes and twos are *not* working against each other—they alternate, and the regularity of their alternation enables us to attend to each in

turn without much trouble; 'the ear remembers and expects,' and the rhythm becomes pleasant. The regularly mixed rhythms, 5–4 and 7–4, may become popular; but I question whether some of the ultra-modern music ever will—that type in which one measure is in 2–4, the next in 5–4, the next perhaps in 9-8, and the next in 3–2.

384. The man in the street cannot adjust himself to this tipsy kind of movement. He feels 'at sixes and sevens.' His mind resents the absence of the regular swing that it expects; and he does not know how to console himself, as my readers might, by treating mixed rhythms as an intellectual exercise.* Invent as we may, the mind has its own ways of doing things. Professor Alexander Bain says:

> 'The observance of time in a succession of notes is a kind of concord between what is past and what is to come—a harmony of expectation—and the violation of it is a jar or discord, and is painful according to the sensitiveness of the ear.'

Wundt has shown us by a very simple experiment that it is extremely difficult to listen *un*-rhythmically even to a simple succession of single beats (127).

385. Now to recapitulate, and then to see how it all works.

* In a lecture that M. Jacques Dalcroze gave recently (1918) on the subject of rhythm, he improvized, in his inimitable way, with the object, apparently, of introducing into one composition as many irregular rhythms as possible. But the man himself is so intensely rhythmic that through all the irregularities there was a certain regularity of recurrence. It is difficult to describe the effect; but one might say that it was *the regularity of the irregularities* which prevented that topsy-turvy feeling which the rhythmic mind resents.

(*a*) *Similar* ideas need no description. Having an affinity for each other, when they meet they fuse, and the original idea becomes stronger.

(*b*) *Disparate* ideas belong to different classes. Not having a natural affinity for each other they do not fuse, but they combine and become a complex idea.

(*c*) *Contrary* ideas belong to the same class, but within that class they differ. They neither fuse nor combine; they arrest each other.

In teaching we should make for as much fusion as possible, and some arresting elements may be avoided if we do not become too discursive, introducing irrelevant matter by way of illustration. Confusion often arises from too much well-intentioned 'help.'

386. Most of our ideas, even a child's, are complex. Then what happens when two complexes meet?

'In the case of the two complexes being brought into consciousness together, all the similar elements in the two fuse, all the disparate elements proceed to form a new and more elaborate complex, while the contrary ideas arrest each other.'—*Adams*.

387. A child who is familiar with an upright piano in his own home is taken to a concert and sees a 'grand' for the first time. It attracts his attention and interest, for its keyboard calls up in his mind the image of the piano at home. But the two piano images don't agree. This long, flat, three-legged thing is not like the piano he is accustomed to; but yes, it *is* a piano, for presently some one comes on to the platform and begins to

play. Now, hitherto the child has only associated music-making with his mother and sisters and their lady friends; but this player is a man—a man, just like Daddy—and no one would dream of Daddy playing the piano. The child's ideas are upset, most of all by that funny piano, whose shape worries him. But the keyboard and the musical sounds fuse with the similar elements in the old piano-complex; while the disparate elements—the male performer, his position at the instrument, etc.—soon combine with the more familiar elements, giving him a wider notion of a pianoforte and its possibilities. The formation of the new complex is hindered for a while by the shape differences. These fight with each other, arrest and obscure each other, but finally drive each other out of the dome, and the piano-idea remains, stronger, fuller, and clearer than before.

388. So you see that this process of arrest, which at the first glance seems as if it would prevent clear thinking, really helps it, by clearing out of our way *the things that don't matter* in the formation of the new complex. Flatness or uprightness, length or number of legs, are not essentials in the idea of a piano; the keyboard and the music are.

'The main work of arrest in the formation of new groups is to prevent the accumulation of unnecessary details.'—*Adams.*

389. As we have to be constantly adding new ideas as well as strengthening the old, we find complication and arrest as well as fusion occurring in our simplest lessons. Take the first scale-lesson at the keyboard.

390. The child has been accustomed to singing from the modulator—the scale picture, with its big and little steps, is familiar. He can sing the scale at any pitch, and he knows that the tune of it is always the same, be it high or low. Now we take him to the keyboard and let him play C to C' with one finger. He hears the same scale-tune. Perhaps he jumps to the conclusion that if he starts a little higher or lower he will hear it again; so we let him try, and suggest beginning on G. But at one place he gets a shock; the *te* is all wrong. The sound he hears and the sound he expected to hear clash, and there is a temporary arrest. But we show him how to adjust his keyboard scale to the steps of the modulator, and the arrest is over; *te* holds its place (379).

391. Now notice this. When the child sings from the modulator, though we change the pitch (i.e. the key) at will, not only does the scale-tune persist, but the scale-picture, the outward and visible sign, remains the same. But when he transfers his scale-tune to the keyboard it is otherwise. The scale of G has a different *shape* from the scale of C; and with the building of each new scale we have practically the formation of a new complex. The tune persists, the shape changes. Compare the shapes of the scales G and F, of A and E♭:—

G ------¯- A --¯--¯¯-

F ---¯---- E♭ -_-_--_-

392. The memory of scale-shapes and chord-

shapes is important, for it affects fingering. The experienced pianist has it. He does not have to think about fingering, unless something specially crabbed occurs—and it ought not to occur in really pianistic music. His finger is guided by his consciousness of scale-shapes and chord-shapes. In many cases it is simply the result of cumulative experience without very much thought. We cannot give our young pupils an equal amount of experience, but we *can* make them think. Instead of merely marking fingering for them, we can accustom them to choose it, on the basis of their knowledge of scale-shapes and chord-shapes, combined with the sense of the passage and its breathing places. So we can speed up the fingering sense, which is so important to the reader; intelligence, to a certain extent, overtaking experience.

393. We can understand how apperception masses can be formed by the fusion of *similars*; indeed, one Herbartian writer says that the term apperception properly applies only to the class of similar or analogous ideas. But the mind cannot be fed on similars alone. There would be no growth, no expansion. Such a mind could only be approached from one side. But by the process of complication it gathers in new ideas, and every fresh complex helps to form a new apperception mass or to make an existing one fuller; so that the mind can reach out in many directions for fresh food, can be approached from many sides, and offers many points of contact from which we can start either a new lesson or a new subject.

394. If we are to find points of contact it is

evident that we must know the present content of the mind with which the contact is to be made. Not only so, but we must remember that the *whole* content of the mind in question has to be reckoned with. Only in the light of such knowledge can our classification of ideas be of use to us; but with that knowledge our way is plain. For if each idea which we wish to present to the pupil's mind must belong to one of those three classes, we know how his mind must react on that idea, *always provided that we know what his mental content is.*

395. 'A given mind possessed of certain ideas must react in a determinate way upon a given new idea presented to it. Any one, therefore, who knows the general laws of mental activity and the content of a given mind may act upon that mind with a fair chance of being able to produce a desired mental result.' And again: 'We are sure of our ground in exact proportion to our knowledge of the content of the soul in question.'—*Adams.*

396. This sounds almost too good to be true. But it works. And see what an utter change it brings about in our notions as to the relations of teacher and pupil. The old idea about teaching was that the mind of a young pupil was 'a fair white page' on which the teacher might inscribe whatever he himself knew; 'an empty vessel,' into which he might pour any information he liked, and when he liked. (Such ideas are not by any means exploded; would that they were.) But we are learning truer theories, working them out in truer practice. We know that the child's inner world is not empty, but very full and active; and we know too that every idea already in that little

pate will either help or hinder us, will be to us either a friend or an enemy.

397. So there is quite a good deal to do at first interviews with new pupils before we can plunge into giving them a first lesson. We have to take stock of their mental possessions. In this hunt after their ideas we must be careful *not to talk too much ourselves*. Our aim must be to get them to talk to us. By tactful questioning we can lead them to tell us about the things that interest them most. Where their interests are strongest, there we find the largest apperception masses; among those interests we must look for our points of contact.

398. Once started, our task is easier, our way clearer; for every lesson in a series—if the series is rightly arranged—helps to provide apperceptive ideas for the next lesson. So 'the soul is in the teacher's hands, inasmuch as the apperception masses can be made and modified by the teacher.' But all the time we must remember that other ideas besides those that we furnish will creep in, and that it is the whole soul-content that apperceives. So we must watch out for those intruders, or they may prove potent elements of arrest. When a difficulty arises for which we cannot at once account, we must stop and find the cause, and adjust the pupil's ideas before we proceed.

399. We have noted that one idea may belong to several apperception masses, and this may lead to misunderstanding, for words which have one meaning for the speaker may have quite a different connection in the mind of the person spoken to,

especially if the latter is a child or a person of limited intelligence. The word *Canterbury* would probably bring into the minds of most educated people ideas of the old Cathedral and of Thomas à Beckett. In the mind of my cook the connection would probably be with *lamb*. What different mental images would the word *box* call up in the minds of: (*a*) a pugilist, (*b*) a gardener; (*c*) a coachman, (*d*) a lady going to the opera!

400. And not only has an idea different associations in different minds, but it has different associations in the same mind. It belongs to different apperception masses, and which of these will be fetched up by the word depends largely on what we happen to be thinking about at the time; or, as Professor Adams puts it, on our mental background. There is a well-worn story that illustrates this. An old couple are sitting by the fire in their quiet country cottage. The crickets are chirping on the hearth, and through the silence comes the hymn that the choir is practising in the neighbouring church. 'How pretty it sounds,' says the old woman, thinking of the music. 'Yes,' says her husband, thinking of the crickets, 'and 'tis said that they do it with their hind legs.'

401. The great war has been almost a permanent background to the minds of most of us. Any time within the past four years the mention of 'Brussels' would call up ideas of Prussian cruelty and misrule, of robbery and starvation. In pre-war times its association in British minds would probably have been with weddings and lace, with music, perhaps, or even with humble sprouts.

402. Again, if we happen to be talking about wars and battles, Waterloo would call up not only Wellington, but Blücher and his Prussians, Hougoumont, Brussels, and the famous ball. At another time it might mean to us only the southern terminus of the Bakerloo Tube.

403. At a dinner party we feel constrained in conversation with our partner at table until we get into touch with his mental background; and two people who have much in common may miss some pleasant intercourse because neither has courage to ask the other, 'What are you chiefly interested in?'

404. 'Most of the honest, that is, unmalicious, misunderstandings of life are the result of failing to make allowances for the background in the mind of another.' This is sadly true. Few of us, perhaps, have sufficient imagination to realize that we are flinging our argument against something from which it simply recoils.

405. If this is to be deplored in ordinary dealings with our fellows, it is much more deplorable in dealing with our pupils. A pupil, usually diligent, is not attending to the lesson, his mind is occupied with something else. Until we can get rid of that something else—can change his background—we cannot do much with him. There may be a punishment hanging over him, or an anticipated pleasure taking up his thoughts; whatever it is, we must get at it. 'Mary,' said a music teacher who felt that her words were going in at one ear and out at the other, 'I don't think that you are attending to the lesson one little bit. Tell me what

you are thinking of.' 'It's Daddy's birthday,' said the child, now bubbling over; and when the sympathetic teacher had been told all about it the subject was deliberately dropped and the lesson went on all right. The birthday background gave place to the lesson background.

406. Your pupil, or your class, may come to you fresh from a lesson on some totally different subject, and when this is so it is as well not to plunge too suddenly into your lesson. If you are class-teaching, the singing of a well-known song, or a round—something that the children know by heart—is a good beginning. If it is an individual lesson at the piano, a few preliminary remarks may be a more effective way of changing the background.

407. We are warned about the importance of securing the same point of view (in the physical sense) for teacher and pupils when imitative exercises, done in class, are in question, and confusion may arise as to 'right and left.' You will recognize the truth of that when teaching little children to beat time. The children say, 'Down, left, right, up,' but as you stand opposite to them your left is their right, and they are puzzled. The confusion may be avoided by the teacher beating with the left hand, but a better way still is to have the exercise done with both hands (*Dalcroze* fashion), when the directions will be: 'Down, in, out, up.' (*See* 'Guide,' Preliminary Course, Second Lesson.) When the movements have become automatic either hand can be used alone.

408. I find that many teachers allow pupils to

leave off beating time very soon. This is a mistake A pupil, *when replying in time-names to a rhythm test*, should always beat. The action helps to intensify the sense of accent. It is not necessary to make the large movements of the early exercises; a slight finger movement is enough. Choirboys do it.

409. When a child, in his early lessons, is learning to listen for 'high and low' sounds and to distinguish them, his experience is, 'high sounds to the right and low sounds to the left' of the keyboard; and when we ask him to shut his eyes and—standing a little way back from the piano—to tell us which we play, it is quite possible that he judges by his sense of direction only, and is not listening for pitch at all, though his answers may be correct. The sound comes to him from the right, a high sound, etc. We can test him by making him not only shut his eyes but turn his back to the piano. Now the *low* sounds will reach him from the right, and if he has not been listening for pitch he will answer wrongly. We can vary the test by asking: 'Is this the sound of a long, thick string or a short, thin one?'

410. This may seem a small point—much ado about nothing; but in teaching *everything matters*. If it is important that the pupil should discriminate, let us make sure that he does discriminate. Teachers often give their pupils credit for mental operations that they desire them to have, when in the pupil's mind quite other activities are at work. Therefore, be alive to all kinds of possibilities, and test, test, test.